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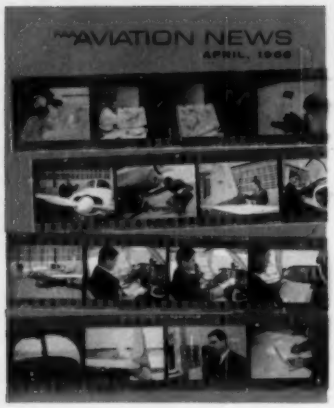

After a period of inactivity, a pilot should not only spruce up his aircraft (page 3), but should sharpen up his own flight procedures.

FAA AVIATION NEWS

FEDERAL AVIATION AGENCY VOL. 4, NO. 12

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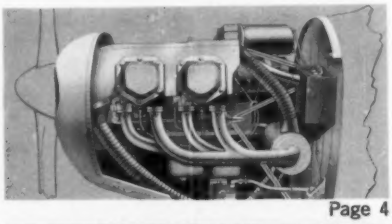
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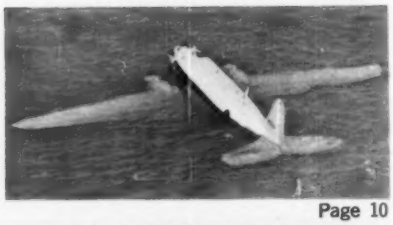
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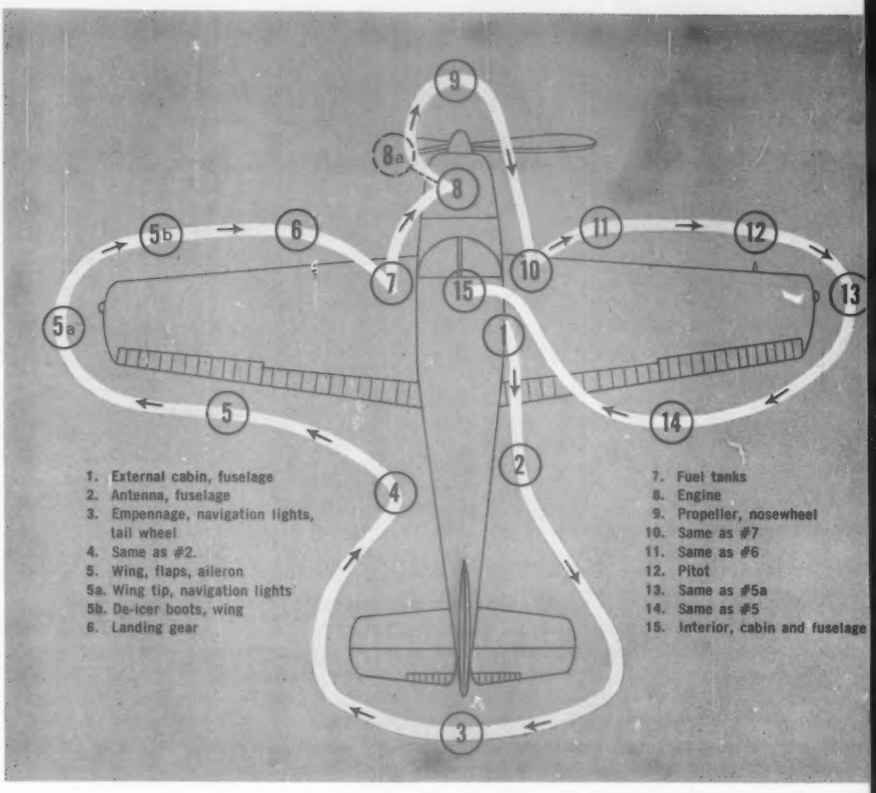
FLIGHT SAFETY

Spruce Up for Spring



Establish an inspection route and stick to it; repetition becomes habit and this is a good habit to cultivate.

There is something about an airplane, snoozing away in long winter storage, that appeals to birds, snakes, insects, rodents, and small field animals. The feathered, scaled, winged and furred little beasts will take up light housekeeping without hesitation in planes left undisturbed for any length of time.

Looking for evidence of their presence should be the first thing you do when you approach your plane in spring for a detailed inspection after long periods of disuse.

Bird nests in air intake scoops impede airflow, resulting in excessively rich mixtures and possible engine stoppage. Nests lodged between cylinders and engine baffles cause overheating, pre-ignition and detonation. Insect nests obstructing fuel tank vents cause lean mixtures and fuel starvation.

Excretions from rodents are highly corrosive to aluminum alloy metals and harmful to wood and fabric. Mice remove ribstitching, making wings unsafe.

Because of possible animal habitation, before you take your airplane out of storage this spring, pay special attention to:

- Oil coolers—intake scoops
- Carburetors—intake screens and passages
- Fuel tank vents—free of obstruction
- Pitot tubes—free of obstruction
- Fuselage—interior and baggage areas
- Wings—interior of wings and control surface
- Static vents—free of obstruction

Fundamental to any inspection is a basic knowledge of aircraft construction, an orderly method of procedure and the ability to see what you are looking at—*really see and evaluate* what the eye views. If defects require further inspection, call a certificated repair station or mechanic since correction might involve complex disassembly, replacement or the use of tools and test equipment not readily available to the aircraft owner.

Normal wear and tear is the greatest foe of things mechanical, and the airplane is especially vulnerable since it operates in a three dimensional world.

The five basic forces operating against an aircraft are *weather, friction, overloads, engine heat* and *vibration*. These forces reveal themselves in many ways and affect the entire structure of the aircraft during its normal life.

Weather, with its fluctuations in temperature, humidity and precipitation is responsible for oxidation, rusting, corrosion, fabric deterioration and wood decay. Since much of this damage can take place in hard-to-get-at recesses, it is doubly important to be on the lookout for it.

Oxidation is caused by the chemical union of metal and oxygen in a damp atmosphere. It is called *rusting* when steel or iron is involved, and *corrosion* in the case of copper, aluminum and other similar metals. In either case it is progressively destructive and its presence warrants further inspection.

Float planes should be given an especially close examination for rusting. It is possible for water to enter the interior of steel tubing in planes of this type, thus allowing rust to form on the inside. The best way to check for this condition is to drill small holes in the tubing when the aircraft is resting in level attitude. This should be performed by—or under the supervision of—a mechanic or repair station since specialized experience and skill is required to determine where water is most apt to concentrate. Restoration of the probed area is best done by a skilled, well equipped mechanic.

Corrosion of aluminum surfaces is revealed by a grayish-white color and by flaking, pitting, or powdering. Since

it can take place underneath paint, the suspected part should be cleaned to the bare metal and examined in detail.

Dull varnish on wooden members is the tip-off that decay might be present. Aircraft plywood is susceptible to decay, especially at the ends of the laminations. Moisture can affect glued joints so that the laminations separate, allowing the thin veneer to rot rapidly. Healthy wood will splinter when probed with a dull knife; decayed wood will crumble or break away in chunks.

Decay of fabric is somewhat similar to that of wood. If left exposed to the elements, fabric absorbs moisture, dirt and oil. In addition, the sun's ultraviolet rays produce a destructive chemical action. All abraded, worn, dull and cracked fabric surfaces are suspect. Washing these surfaces with mild soap and water at reasonable intervals will do much to prolong the life of dope and fabric.

Friction is the resistance to relative motion of two bodies in contact and the effect of friction is *wear*. Wear cannot be prevented but proper lubrication and alignment of moving parts will lengthen the life of moving parts. Friction damage can be one or all of the following:

Galling—when certain materials in close contact with each other "freeze" under friction or pressure due to lack of lubricant or improper lubricant.

Abrasion—caused by the presence of gritty particles between moving parts. In some cases this can be detected by moving the controls.

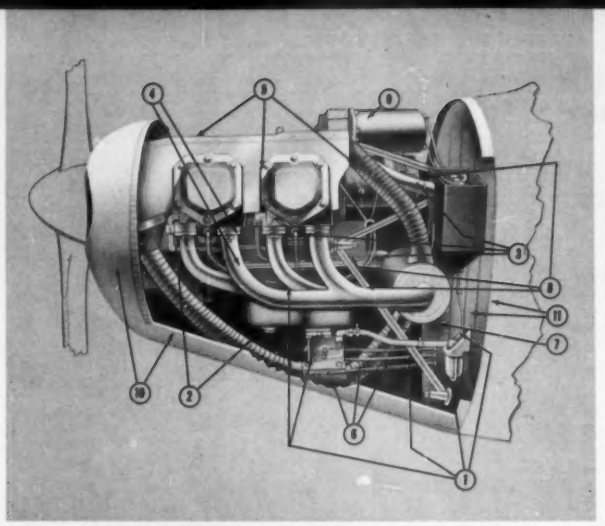
Chafing—wear between two parts caused by rubbing or sliding of one on the other. Chafed fabric, wood or metal can easily be detected since it usually occurs between parts of the movable control surfaces coming in contact with fixed components. Chafed metal parts have a bright, shiny appearance.

Cutting—grooves in the worn part are the giveaway here.

Elongation—when the clearance becomes excessive between a loaded bearing surface and a rotating part, the bearing area tends to elongate or wear in an egg-shaped fashion.

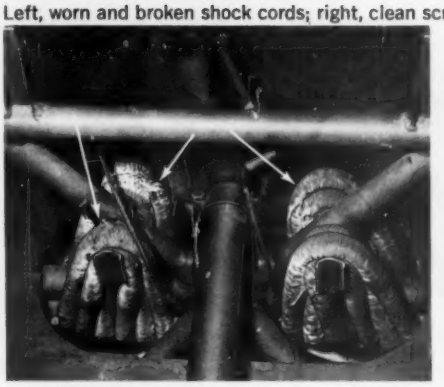
Overloads. Personal aircraft are well designed to absorb loads imposed during normal operation. When these loads are exceeded the affected part usually becomes deformed and could result in a serious structural weakness. Deformation is usually visible.

In the majority of cases, a deformed part, besides losing its required strength, often *places overloads on parts of structures attached to it.* Overloads occur when there is unusual tension, compression, bending, torsion or shearing.

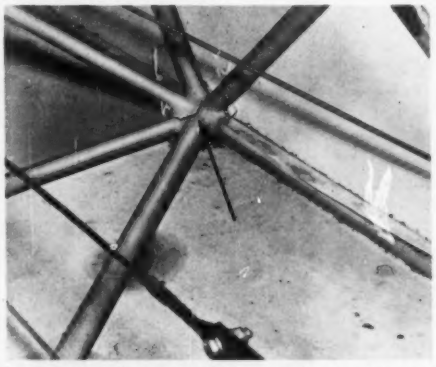


1. Engine fuel system
2. Engine oil system
3. Engine ignition system
4. Exhaust system
5. Cooling system
6. Engine controls
7. Exhaust heater system
8. Engine mount
9. Accessories
10. Cowling
11. Firewall

Left, worn and broken shock cords; right, clean screens.

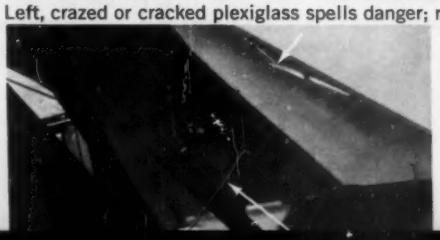


Look for cracks in welds.



Inoperative plane provides example of extreme propeller damage.

Left, crazed or cracked plexiglass spells danger; right, check finish for cracks.



Engine heat is another factor acting on an aircraft. From the inspection standpoint it is divided into two categories:

Direct—source is exhaust gases. At the same time there is also indirect heat radiating from the exhaust system components, in addition to the hot gases or flame coming out of the exhaust outlet. To forestall serious hazards, take a hard look at exhaust pipes, clamps, bolts, braces and welds. Heater muffs or shrouds should be removed to allow detailed inspection.

Indirect heat—this comes from the operation of the engine proper and is carried off by the air stream passing through the cowling. Excessive indirect heat may be indicated by:

- high oil temperature
- high cylinder head temperature
- blistering of the paint covering adjacent parts within the engine compartment
- odor of burned oil or hot rubber during or after engine operation
- auto-ignition after engine shut-down (engine continues to try to function)

Vibration is the source of many troubles and defects occurring throughout the life of the aircraft. Noticeable vibration is caused by a malfunctioning power plant, worn engine mounting pads, unbalanced propeller or a loosening of the aircraft structure. It should be corrected as soon as discovered since it will cause abnormal wear between moving parts and may induce fatigue failure in other aircraft components. Unnoticeable vibration, on the other hand, is caused by the rotation of the crankshaft, flywheel and propeller. It can only be detected by complex instruments.

While a thorough spring checkup is a good idea, especially after a period of storage, it's important to remember another point. Federal Aviation Regulations require aircraft to have a *periodic inspection* during the preceding 12 calendar months. It must be approved for return to service by a certificated mechanic holding an inspection authorization, a certificated repair station or a manufacturer authorized to conduct inspections.

The FARs also provide for a *progressive* inspection that is acceptable in lieu of the periodic inspection.

The initiative is up to you—get going—and happy flying in a safe airplane.

DO:

- have an assortment of proper tools for inspection.
- use an inspection check form.
- use a regular inspection procedure and *stick to it.*
- remove all inspection plates and cowlings.
- thoroughly clean all items to be inspected.
- check that all moving parts are properly lubricated.
- familiarize yourself with proper safetying techniques.
- inspect for proper safetying.
- check the "jam" or locking nuts on push-pull controls and adjusting devices.
- resafety a part you have "unsafetied" *before* inspecting the next item.
- consult with authoritative advisers if the occasion arises (a certificated mechanic, an approved repair station or your local FAA inspector).

DON'T:

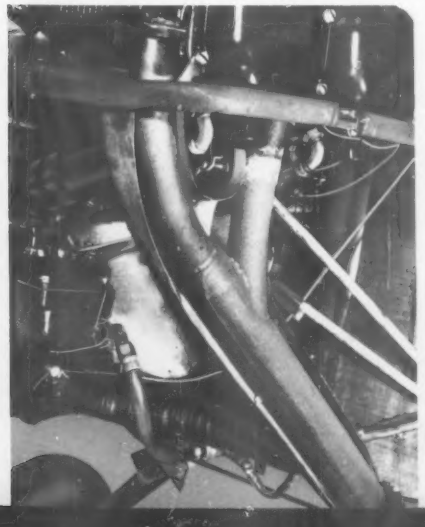
- check landing gear by kicking it—raise it off the ground.
- be hurried—take plenty of time to properly inspect each item.
- move the propeller unless the magneto switch reads "OFF," or the ignition system is otherwise rendered inoperative. Even so, *be wary.*
- neglect hard-to-reach items.
- presume an item is airworthy before checking it.
- be embarrassed to ask questions.

Above, battery wants attention. Below, bad weld, broken safety wire are hazards.

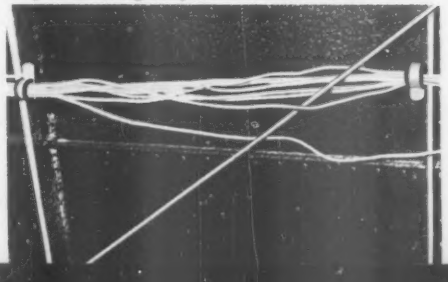
Drain fuel into glass jar for close look.

Housecleaning includes bird's nest.

Left, remove manifold shroud, check for cracks; right, check pitot tube obstructions.



Wayward wiring subject to unusual wear.



HOP, SKIP and JUMP

Island Airlines bills itself as the world's shortest airline. Its longest route is nine miles. But it could also call itself the friendliest and most casual. The pilots and the regular passengers know each other by their first names, and the company's three vintage aircraft are part of the community life of four villages. They are used for weddings, funerals, as school buses, moving vans, ambulances, hay wagons and what have you. As a matter of fact, Island Airlines pilots will, for a small fee, do the grocery shopping and deliver milk.

Island Airlines connects four small islands in Lake Erie with the Ohio mainland. Its home base is Port Clinton, a small peninsula town about halfway between Cleveland and Toledo. For equipment, Island Airlines uses two old Ford *Tri-Motors* and a Boeing 247 in regular daily scheduled service.

The FAA general aviation district office in Cleveland has a fond regard for Island Airlines. "It's the darndest operation you ever saw!" according to Ivan (Ike) Hillyard, supervising inspector. One of his big jobs, he says, is to try to interpret *Federal Aviation Regulations* written with the big carriers in mind but which apply to Island Airlines' three airplanes with its nine mile route structure. But he is not too concerned. "These fellows know their equipment and their flying. They have a fantastically good safety record."

The company does its biggest business in the summer when it transports thousands of tourists out to beautiful Put-In-Bay or to Middle Bass or North Bass Islands. In the winter, however, the airline becomes the only dependable source of transportation for 200 or more families who live permanently on the four islands.

It is during these winter months that Island Airlines fulfills the combination role of family automobile, taxi, Toonerville trolley and general factotum. A Catholic priest uses it to get around on Sundays. Three youngsters who use Island planes to go back and forth to school have only missed two days in the past three years, and island housewives regularly use air service to do the grocery shopping.

This kind of air service has paid off for the company. Last year it handled more than 35,000 passengers, 300,000 pounds of cargo and 135,000 pounds of mail.

Island has had only one customer complaint. He was a passenger who refused to fly. He walked off the plane after noticing a tombstone strapped to the floor beside his seat.

By Dick Shea

Strangers driving past the Island Airlines base at Port Clinton, Ohio, are sure they are seeing things when they glimpse an ancient Ford Tri-Motor taking off. But to these school kids, the old bird is just another kind of school bus.

you **CAN** *get There from Here*

all it takes is a little planning

Being 99.9 per cent right is a very fine score indeed but it is not exactly a passing grade when the subject happens to be cross country flying, especially when the destination is an unfamiliar airport. A lot of precious fuel can go up in smoke while searching for a landing spot.

Frequently a long cross-country is successfully completed only to have the pilot become lost on arrival over the town where the airport is located.

Happy landings are the result of following established procedure.

When nearing the airport at the end of a cross-country hop, a pilot should plan his descent from cruising altitude so that he will be in a position to make an appropriate landing approach as soon as he reaches the airport traffic pattern area. If he is familiar with the airport, or operating under the instructions of an airport control tower, his initial approach should be at traffic pattern altitude.

In approaching an unfamiliar airport, the pilot should fly over or circle it at above traffic pattern altitude, usually at 2,000 feet or more above the surface, to observe the airport layout, local traffic and the wind and traffic direction indicators *(Figure 1)*. These usually are prominently located near the center of the airport or adjacent to the operations office.

Figure 1.

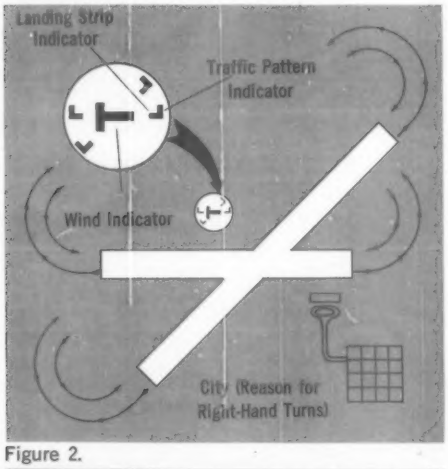
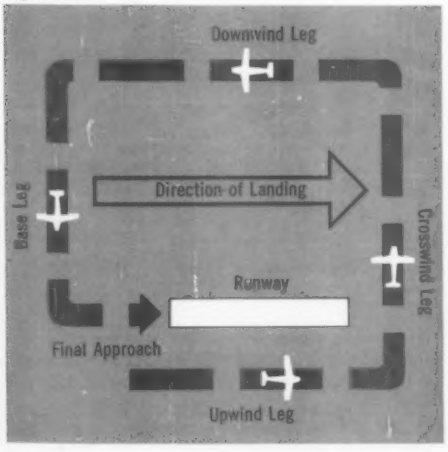


Figure 2.



Local traffic rules for most civil airports without control towers prescribe rectangular traffic patterns above the runway in use, with all turns to the left. Where right-hand traffic patterns are in force, they are indicated by field markers, as shown in *Figure 1*. The usual traffic pattern altitude is between 800 and 1,200 feet above the airport elevation, depending on surrounding terrain.

If the pilot has no traffic pattern information at an unfamiliar airport, and can find no traffic pattern indicator, he should intercept the downwind leg of a rectangular pattern at a 45-degree angle in *level* flight. He should never enter the traffic pattern from above, and all operations within the pattern should be conducted in level flight, with the exception of approaches and climbouts *(Figure 2)*.

When approaching an airport without traffic control, the landing should be made on the runway most nearly aligned with the wind or, if there is no significant wind, on the runway designated by the wind-T, tetrahedron or similar marker. If there is local traffic at the airport, the landing should be made on the runway in use by aircraft on local flights.

At uncontrolled airports where radio communications facilities such as flight service station or an airport advisory station (UNICOM) are available, the pilot should request information on the runways in service and local conditions before entering the traffic pattern.

Information received from such stations is for the pilot's use *only* to determine his course of action. Only airport traffic control towers can give landing instructions and clearances.

When a flight to a strange, undesignated landing area is planned, such as a farm strip or body of water where there is no seaplane base, a pilot would be well advised to become familiar with landing conditions as they really are before taking off. It might be, for example, that his destination has hidden open ditches or, if a body of water, insufficient depth.

Such information can be obtained through personal contact or by phone with someone at a nearby designated landing area who is acquainted with local conditions. A few moments spent in asking some basic questions may *prevent* a possible accident.

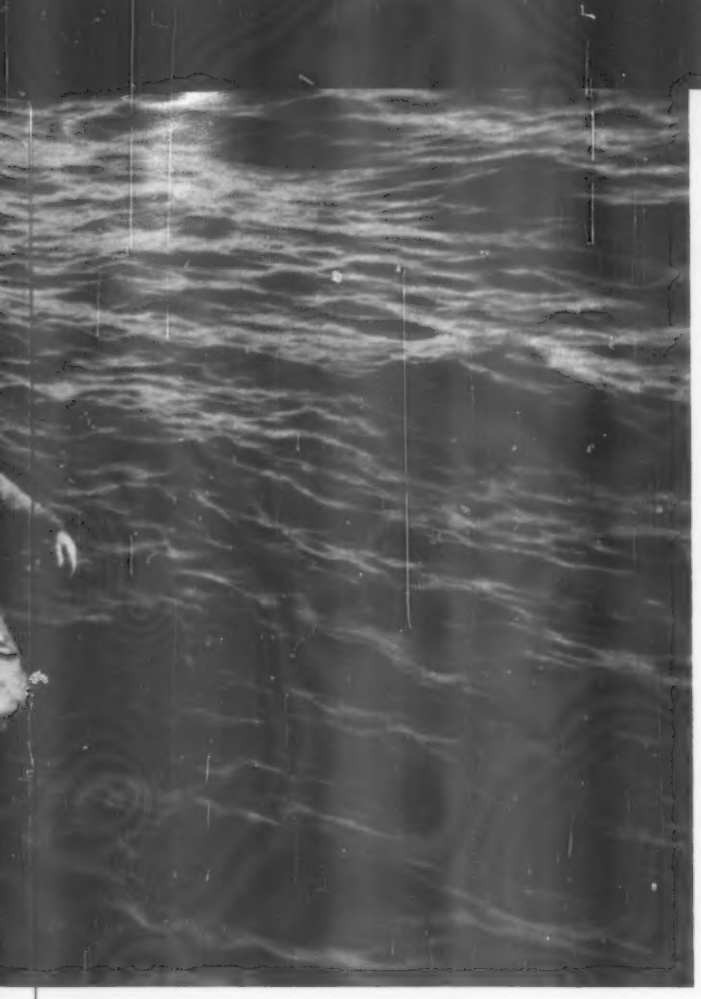
When flying cross-country a lot of the uncertainty can be eliminated by keeping these points in mind:

- When the flight is made using VOR as an aid to navigation, the pilot should carefully note the radial from the last VOR station used on which the airport is located. This should be checked before the station is approached.
- If the destination airport is served by a control tower, the tower should be contacted for traffic information about 10 miles out. In the event the pilot is not familiar with the area, he should resolve all questions about normal approach flyways, traffic pattern entry points and altitude at this time.
- The new Local Visual Navigation Charts are very helpful in locating airports in large metropolitan areas, and they also provide obstruction and runway layout information about major airports.
- Look for air markers on buildings, oil tanks and highways.

Successful cross country flights start before you start your engine with either a visit or a phone call to your flight service station for the latest weather and NOTAMs.

SURVIVE
SEA LANDING

COAST
GUARD



Planning an overwater flight? Here are some pointers for a happier landing, wet or dry

THE ENGINE of the small, single-engine plane kicked once, then quit cold. The pilot broadcast a distress message, but received no reply. Minutes later, he ditched in the Atlantic between the Bahamas and Miami and climbed into a small, two-man raft. He was safe for the time being. One-half hour after the ETA, the Miami Flight Service Station (FSS) asked whether the flight had arrived at the airport of destination. No arrival. After checking several other airports in the area and at the point of departure, the Coast Guard's Miami Rescue Coordination Center (RCC) was alerted.

About one hour after ETA, an *Albatross* amphibian lifted off from the Coast Guard Air Station at Miami and began a search of the track line from Miami to Nassau. At Miami and Fort Lauderdale, Coast Guard cutters got up steam. Ramp checks at airports and landing strips throughout the area were made to determine if the aircraft had landed and failed to close its flight plan. While these checks were in progress, the *Albatross* continued its search.

At five minutes after 8 o'clock that night, the pilot of the search plane saw a flare ahead and dropped a float light to mark the spot. The survivor had been spotted. A helicopter was dispatched and picked up the pilot. He was little the worse for his experience, thanks to basic survival equipment and his foresight in filing a simple flight plan.

The ending isn't always that pleasant. Last December a pilot rented an *Aircoupe* in Fort Lauderdale and took off for Grand Bahama. A Defense VFR flight plan was filed, but the pilot indicated that he would not make an arrival report when he reached his destination. The survival equipment he carried was limited. More than 24 hours later, the Miami FSS was advised by the owner of the aircraft that it had never reached its destination. Miami RCC was alerted. Despite a massive search, no trace was ever found.

Survival chances, even in warm water, diminish rapidly. An aircraft may sink within seconds. In the rapidly-moving Gulf Stream the search problem was enormously complicated because the survivors could have been carried north more than 100 miles during the interval between the ditching and alerting of rescue facilities.

The filing of a flight plan, particularly for flights over water, can be indispensable for survival. Without one, a pilot forced down at sea is up against nightmarish odds. And filing a flight plan is not enough; the pilot must also adhere to the plan. If a plane goes down, the search and rescue (SAR) forces will first scour the planned route, extending the coverage far enough to each side to allow for normal navigation errors. If searches of the most likely area are not successful, the search is expanded. But such expansion takes time and there is a practical limit to the area of any search.

One pilot wandered 200 miles off course on a 100-mile flight between two cities and was forced down in the desert by fuel exhaustion. He lasted nine days before dying of thirst. A search by more than 30 aircraft, extending 50 miles to each side of the track, was unsuccessful. Another light plane, encountering electrical difficulties on a flight from Bermuda to the Azores, aborted the flight and turned back to Bermuda. Unable to find the island, the pilot continued westward, finally making a landfall in the Bahamas with nearly empty tanks. Obviously, SAR aircraft would not have been searching the route to the *west* of Bermuda had he gone down.

In one weird incident, an aircraft enroute from Los Angeles to Bakersfield, Calif., became disoriented and ditched beside a vessel 200 miles off the Pacific Coast. In such extreme deviations, the pilot is, for all practical purposes, "dead" when he lands unless a chance passerby sights him.

Thinking pilots simply do not fly over the ocean unless they have filed a well-prepared flight plan, are equipped with adequate sea survival gear and have sufficient communications.

The survival kit should include a life jacket for each occupant, an *accessible* life raft, and suitable detection aids. The most effective of all detection aids is the personal locator beacon—a small, battery-powered transmitter. This can be heard for 50 miles or more by search aircraft, which can then home in on the signal source. Other essential aids include day smoke signals, flares, dye markers and signal mirrors. Like the raft, they must be accessible. (The best place is attached right to the life jacket.) The occasional over-water pilot can sometimes rent survival equipment from an airport operator. Survival equipment is like a parachute—if it is ever needed and not available, it will never be needed again.

On a fine spring afternoon, a light plane enroute from Grand Bahama to Miami suffered engine failure at 8,000 feet over the water. The pilot was in communication with West Palm Beach FAA tower and broadcast a distress message. An SAR airplane and helicopter were alerted and airborne in less than five minutes. The distressed pilot was on a flight plan; his position was given, but he had no survival equipment. As he came down, he tore up his chart and threw small pieces over in an attempt to mark his position. Not a

trace was ever found, despite ideal search conditions. A man in the water without detection aids can easily be missed, even by a search aircraft flying directly overhead.

Most light, private aircraft operating over water will have VHF. On short hops, it is important to have sufficient altitude to maintain communications. The altitude also permits more time to get out a message in time of distress, and provides gliding distance. The content of the distress message is important. Open up with the declaration, "MAYDAY!" Here is what the SAR people need to hear:

"MAYDAY . . . MAYDAY . . . MAYDAY . . . THIS IS NOVEMBER 5472 . . . NOVEMBER 5472 . . . NOVEMBER 5472 . . . MAYDAY . . . MAYDAY . . . MAYDAY." If time allows, follow it up with your position. If you are not sure of your position, tell the world about it. This is no time to be coy. Add any usable information—OMNI bearings for example. Keep talking as long as possible, for DF stations ashore will be taking radio bearings. Break the transmissions occasionally to allow the rescue people to give instructions or ask for information.

While waiting, the downed pilot must conserve his detection aids. He should not use them until a ship or planes comes within range.

How is the Coast Guard alerted when an aircraft is in distress? If a distress message is received by an FAA facility or the aircraft is overdue on a flight plan, the FAA immediately notifies the nearest Coast Guard Rescue Coordination Center, and the entire SAR organization is rolling within minutes. No further alerting action is required of the distressed pilot. If the pilot was unable to get out a radio call and was so inexperienced as to take off without filing a flight plan, the first alert will probably occur in the mind of a worried friend or relative. Such a person should contact the nearest FAA or Coast Guard facility and tell them of the situation. Action will then be initiated promptly though considerably later than would have been possible with a properly planned flight.

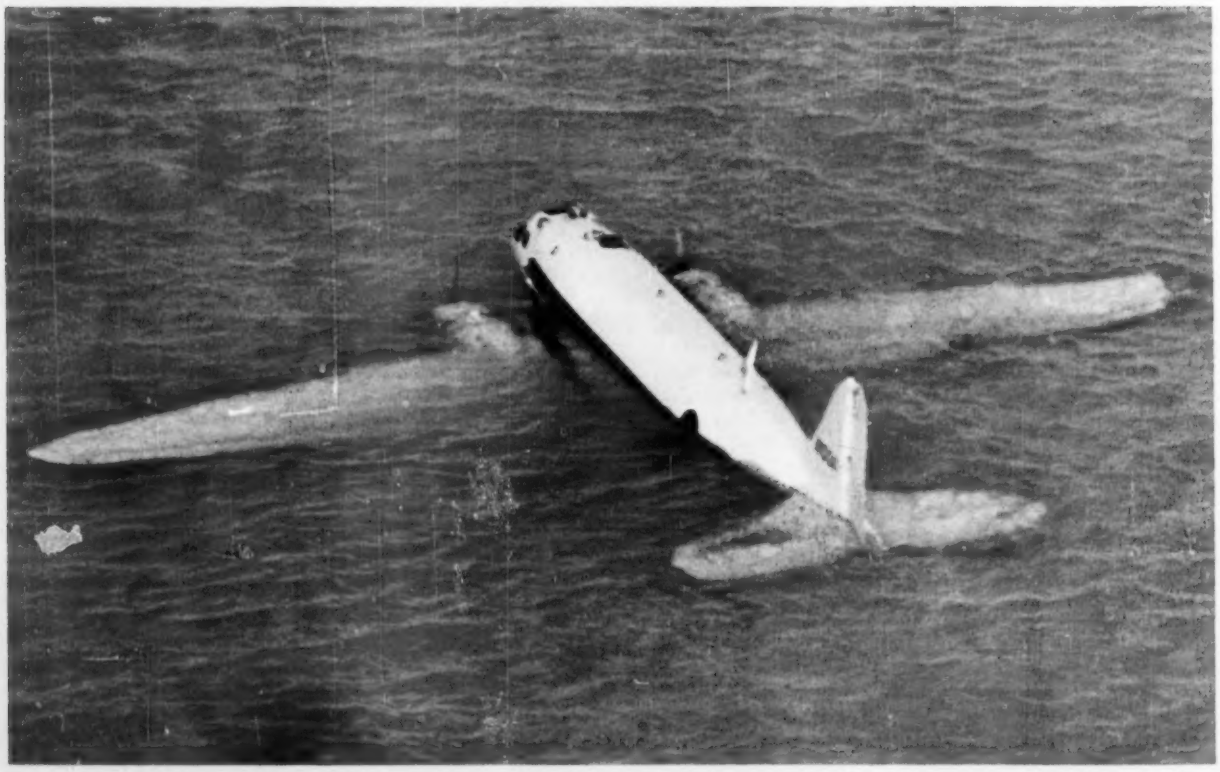
When a pilot files a flight plan, he is obligated to close it out promptly on arrival. Failure to do so may result in an expensive and time-consuming search, costing the taxpayers thousands of dollars. SAR pilots and the FAA become understandably irritated when they search all night for a careless pilot who is sleeping soundly in a comfortable bed. The FAA will take prompt enforcement action for such gross negligence.

Light aircraft are within range of many areas that in the past have been relatively inaccessible. When planning an overwater flight, the pilot should consider his actions carefully in the event of an unexpected emergency which might require an immediate landing in the sea. Not only must he know *how* to land his aircraft properly in the sea, but what to do in abandoning the craft should it sink—as it probably would. He must supervise the evacuation of his passengers, and insure that his survival equipment is taken and kept with him.

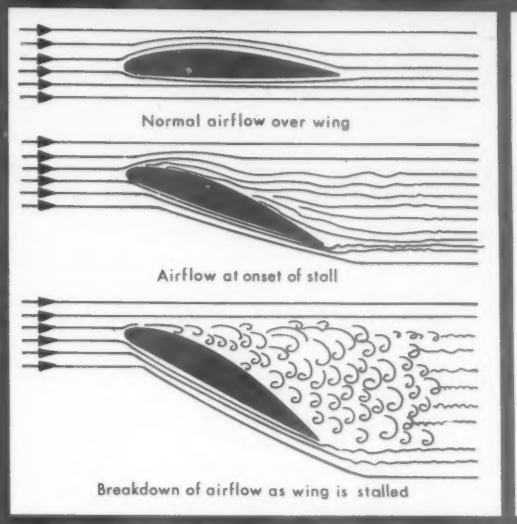
Over water flights need to be no more hazardous than flights over land, if they are properly planned and not conducted over long distances. But before venturing out over water, obtain the necessary equipment, plan the flight carefully, and, by all means, file a flight plan, and close it upon arriving at your destination.

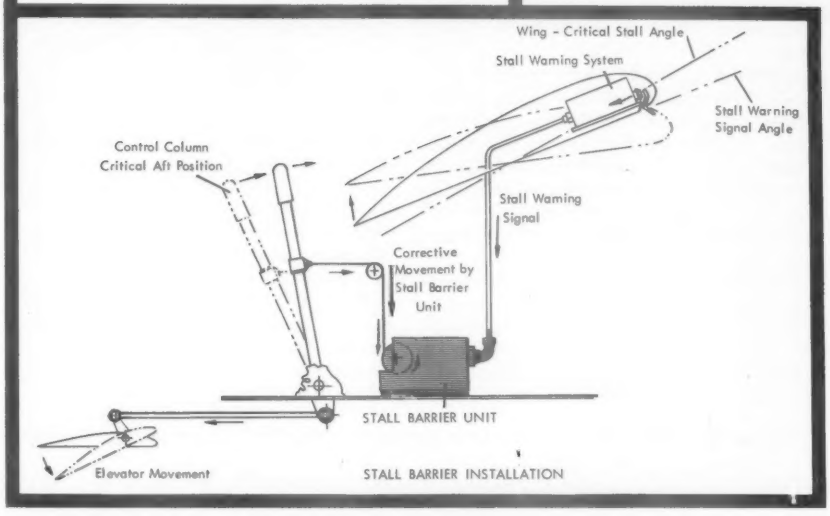
By Capt. John M. Waters, Jr., Chief, Search and Rescue Division, United States Coast Guard Headquarters.

The eight persons aboard this DC-3 were saved after a widespread search when a rescue plane spotted the aircraft resting in three feet of water near the Bahama Islands on a flight from Haiti to Ft. Lauderdale, Fla. Had the craft been ditched in deep water, it probably would have sunk within a few minutes.



THE STALL BARRIER





Since the dawn of aviation, stalls and spins have spelled danger. A 1914 Army report, for example, cited stalling as the "cause of accident" in five of the first 11 fatal accidents in U.S. military aviation.

Today, more than a half-century later, the stall—or the "stall/spin" as the term is used in Government accident reports—remains one of general aviation's big killers. As late as 1964 there were 242 persons killed in 643 "stall/spin" accidents. This accounted for 24.8 per cent of all general aviation fatalities that year. Private and Government organizations concerned with safety frequently stress the problems involved. (See "Quit Your Stalling!" *FAA Aviation News*, July 1965.)

This continuing accident factor brought the FAA Aeronautical Center at Oklahoma City into the picture to study the stall requirements as set up for aircraft manufacturers in FAR Part 23. Could these be tightened? Was there a method of engineering a "no-stall" characteristic into the aircraft that would be completely effective?

A careful study of design factors revealed that little could be done without being too restrictive on the manufacturer. Designers of light aircraft, both single- and twin-engine, have worked for years on various methods of stall identification and prevention.

One such aircraft was quite successful in preventing turning stalling-spins, but the unusual control system caused consternation among pilots who were used to the coordinated flying required for rudder and wheel or stick. It just didn't feel comfortable. As a consequence, sales of this particular aircraft were not as good as expected.

One of the major problems in stall/spin accidents is the need to recognize what is happening and then the need to take corrective action. The pilot, in the landing pattern, might be too busy with the radio and with the job of getting the aircraft down to recognize immediately that the airspeed is dangerously close to the stall speed. This time lag between recognition and action is regarded as a prime factor in stall-spin accidents and deaths.

The military's high speed heavy jets have been equipped for some time with a real attention-getting apparatus, the "stick-shaker." The manufacturers have installed a "stick-pusher" in some of their big jets that actually does move the pilot's control wheel forward as the stall speed is approached. It was the "stick-pusher" that brought out the idea of doing something for the light single- and light twin-engine plane.

The chief of the Flight Standards Technical Division at the Aeronautical Center, C. W. Von Rosenberg, said, "We decided the best thing we could do to stop people from killing themselves in stalls was to simply stop the stalling . . . simple to say, but not so simple to accomplish."

So Von Rosenberg's staff sort of "cobbled up something." This something was a simple electro-servo with a drum and cable attached to the stick in a T-34 *Mentor*, a single-engine military trainer. When the aircraft approached a stall attitude, an electric signal was fed from the stall warning indicator into the servo and the spinning drum inside the servo tightened to pull the cable attached to the stick.

The gadget worked and worked well. A gentle and steady pressure on the stick pulled the aircraft out of the stall attitude and held it there long enough for the pilot to recognize the approach to stall and complete the recovery.

Von Rosenberg's men and others from the Aeronautical Center tested the "stall barrier" in the T-34. All reported that it was easy to handle, that it did prevent a complete stall and, above all, could be overridden by the pilot if necessary. The amount of pull on the stick was only 20 pounds. In other words, it can be overriden when not desired, or to overcome "ground gust reaction" in landings.

Von Rosenberg describes the device as a "stall warning indicator that not only tells, but also takes action." It can be made cheaply and can be installed in any aircraft. It doesn't have to be electric; it can use pneumatic pressure, vacuum, or any actuator that can be triggered by a signal from the aircraft's stall warning system.

Light plane manufacturers are taking a long look at the "stall barrier" and seem impressed at the low estimated price and quick installation of the device in any aircraft, as well as with its paramount feature—that of saving lives.

By Mark Weaver.

1965 WAS 'FLYINGEST' YEAR YET, REPORT SAYS

Flight operations through the national airspace system in 1965 surpassed all previous years, according to figures released last month by the Federal Aviation Agency in its annual air traffic activity report.

The 292 Federal Aviation Agency airport traffic control towers, 14 more than in 1964, reported a record 37.9 million takeoffs and landings during the year—an 11 per cent increase over 1964.

Nearly one-fourth of the airport operations were conducted under instrument flight rules (IFR)—an increase of 15 per cent.

General Aviation IFR Increases 34%

IFR aircraft handled, for the second consecutive year, increased by 10 per cent. There were 12.9 million IFR flights handled by FAA air route traffic control centers. The largest increase—nearly 34 per cent—was in general aviation flying. In comparison, airline activity increased by only 14 per cent.

In total operations (each takeoff or landing is counted as one operation), the five busiest airports were Chicago O'Hare International 519,430; Van Nuys (Calif.) 439,563; Opa Locka (Fla.) 425,323; Long Beach (Calif.) 393,892; and John F. Kennedy International 389,917.

Leaders in airport itinerant operations, which exclude purely local flights, were Chicago O'Hare 519,344 operations; John F. Kennedy International 389,047; Los Angeles International 366,531; Washington National (D.C.) 307,839; and Dallas Love Field (Tex.) 270,034.

Busiest General Aviation Airports

The five busiest general aviation airports were Opa Locka 211,868; Van Nuys 205,193; Long Beach 203,135; Fort Lauderdale (Fla.) 160,660; and Phoenix 151,246.

O'Hare led in air carrier operations with 443,026; John F. Kennedy International had 352,469; Los Angeles International 288,610; Washington National 219,108; San Francisco International 210,948.

Comprehensive data on all FAA control facilities are compiled annually to measure facility workloads and manpower needs and to gauge civil aviation trends in the United States.

The "Air Traffic Activity" report for calendar year 1965 may be purchased for $1.25 from the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402.

Getting the Word

Two visitors from north of the border enjoy a copy of FAA Aviation News *with Allan E. Horning, center, of FAA's Western Region, during a recent fact-finding tour of the U.S. to study control towers. Representing the Canadian Department of Transport are, left, C. Ray Wood and Gary N. Fee. Fee is an air traffic control specialist and Wood is an architect.*

Cloud Hopping Students Wing to Washington, D. C.

Lessons are continued in flight for 16 aviation students from Ohio State University who interrupted their studies in a more conventional classroom to fly to Washington recently in the school's own DC-3. Briefed enroute by FAA movies and by a lecture on the role Government plays in aviation, upon arrival in the Nation's capital the students held discussions with officials of the FAA, the Aircraft Owners & Pilots Association and other groups.

HIGH-FLYING GENERAL AVIATION PILOTS GET LOW-DOWN ON LOFTY SUBJECT

General aviation pilots and aviation enthusiasts are flying more safely and more comfortably today because of high altitude and oxygen training given them by FAA's Office of Aviation Medicine through its physiological training program.

The new generation of aircraft operating at altitudes formerly occupied almost exclusively by military and commercial planes has created a training requirement which cannot be met by every day flying experiences.

The program was established to assist pilots of executive jets and other high performance general aviation aircraft to better understand the functions and proper protection of the human body in high altitude flying. The courses stress total environment—the earth's atmosphere, the physiological problems related to high altitude exposure, the operation of basic bodily functions and the physiology of the respiratory and circulatory systems.

As new civilian high performance aircraft become available with altitude capabilities of 30,000 feet and above, with and without pressurization, the understanding of the physiological problems and the preventive and remedial actions to be taken can be a major factor in avoiding accidents.

There are two physiological (altitude) training courses now available through the FAA to individual pilots as well as to companies:

(1) A one-day session is offered at the FAA Civil Aeromedical Institute located at the Agency's Aeronautical Center in Oklahoma City, Okla.

(2) Arrangements have been made by the Agency to obtain physiological training for general aviation and company pilots at Air Force facilities across the country. The Air Force course lasts a day and a half and each participant is charged $5.

Correspondence regarding either of the above programs should be addressed to the Physiological Operations Section, FAA Civil Aeromedical Institute, P.O. Box 1082, Oklahoma City, Okla. 73101.

Air Force Physiological Training Units are located at 30 bases in 19 states:

Andrews AFB, Md. (near Washington, D. C.); Bunker Hill AFB, Ind. (near Bunker Hill, Ind.); Cannon AFB, N. M. (near Clovis, N. M.); Carswell AFB, Texas (near Fort Worth, Texas); Castle AFB, Calif. (near Merced, Calif.).

Craig AFB, Ala. (near Selma, Ala.); Eglin AFB, Fla. (near Fort Walton, Fla.); Ellsworth AFB, S. D. (near Rapid City, S. D.); Fairchild AFB, Wash. (near Spokane, Wash.); George AFB, Calif. (near Victorville, Calif.).

Langley AFB, Va. (near Norfolk, Va.); Laredo AFB, Texas (near Laredo, Texas); Laughlin AFB, Texas (near Del Rio, Texas); Lincoln AFB, Nebr. (near Lincoln, Nebr.); Little Rock AFB, Ark. (near Little Rock, Ark.).

Lowry AFB, Colo. (near Denver, Colo.); Mather AFB, Calif. (near Sacramento, Calif.); Otis AFB, Mass. (near Falmouth, Mass.); Mac Dill AFB, Fla. (near Tampa, Fla.); McCoy AFB, Fla. (near Orlando, Fla.).

Moody AFB, Ga. (near Valdosta, Ga.); Randolph AFB, Texas (near San Antonio, Texas); Reese AFB, Texas (near Lubbock, Texas); Shaw AFB, S. C. (near Sumter, S. C.); Tyndall AFB, Fla. (near Panama City, Fla.).

Vance AFB, Okla, (near Enid, Okla.); Webb AFB, Texas (near Big Spring, Texas); Westover AFB, Mass. (near Chicopee Falls, Mass.); Williams AFB, Ariz. (near Phoenix, Ariz.); Wright-Patterson AFB, Ohio (near Dayton, Ohio).

Design Date for SST Is Moved Up to Sept. 1 to Meet Deadline

The Federal Aviation Agency is advancing from Oct. 15 to Sept. 1 the date for submission of final design proposals by the two airframe and two engine manufacturers participating in the supersonic transport (SST) development program.

Brig. Gen. J. C. Maxwell, director of the SST development program, said the change in dates will enable FAA to complete its evaluation of the competing airframe and engine designs by Dec. 31 as scheduled.

"If we adhered to the original date for submission of design proposals," he added, "we probably could not meet this end-of-the-year deadline. And, we are determined that there be no slippage in the program schedule as we move from the current design phase into the prototype construction phase."

From its evaluation of the competing design proposals, General Maxwell said, FAA expects to select one airframe and one engine manufacturer to push ahead with SST prototype construction in 1967. The first of these aircraft should be flying by 1970 with certification of the production model in 1974.

FAA Portable Tower Gets Workout

Shortly after the Agency announced the development of a mobile portable tower (FAA Aviation News, *March 1966*), *the tower at the Lockheed Air Terminal in Burbank, Calif., left, was destroyed by fire. The portable tower, right, was flown to Burbank by an Air Force C-124 from the FAA Aeronautical Center in Oklahoma City, Okla., and went into service within 12 hours after reaching the site. Shorn of its wheels, it is to be placed atop a 40-foot support where it will serve the airport until a new tower is constructed.* UP International Photo.

ALASKAN, WASHINGTONIAN WIN TOP AVIATION MECHANICS SAFETY AWARD

Alfred L. James, left, Anchorage, is winner of General Aviation mechanic crown. Top Air Carrier mechanic is Harold Priest of Seattle, right.

A native Alaskan and an artist-turned-mechanic from Seattle were named last month the top two aircraft mechanics in the United States.

They emerged winners in the FAA's third annual Aviation Mechanics Safety Awards jointly sponsored by the Agency, the aviation community and the Flight Safety Foundation. They were picked from 17 regional winners named in February.

Alfred L. James won the General Aviation mechanic crown for his ingenuity in winterizing a Bell 476-2 helicopter. He has served as superintendent of maintenance and chief inspector for Alaska Helicopters, Inc., Anchorage, since March 1959.

The number one mechanic in the Air Carrier category is Harold Priest, a crew chief with West Coast Airlines, Seattle, who devised a plate-seal combination which prevented moisture accumulation in the fuel trimmer actuator case of the Rolls-Royce *Dart* engine.

Before his modification, moisture seeping into this component could freeze, restricting the operation of the trimmer, affecting jet pipe temperatures and causing engine shutdown.

A skilled artist, Priest made a "flip coin" choice after World War II between palette and plane and elected to follow the aircraft mechanic trade.

Among his other accomplishments, he designed and built a special DC-3 work stand. The construction was light and strong, so strong in fact, that it supported a DC-3 when the landing gear collapsed, thereby saving the life of a man working in the well.

James' winterization of the helicopter involved the production of a fiberglass ski. He also engineered a method of attachment and had the installation approved by the FAA. The skis eliminated the maintenance and safety problems involved with the frequently used laminated neoprene flotation bags which often failed when temperatures fell to 30 and 40 degrees below zero.

Both men will be presented with a mounted medallion, created for the FAA and donated by American Aviation Publications, in Washington, D. C.

All winners, including 38 state champs, will receive a citation and their choice of tuition-free technical aviation courses at the FAA Academy in Oklahoma City. In addition, regional winners will receive lapel pins indicating membership in an exclusive mechanics club organized by Champion Spark Plug Co.

'ON THE SCENE' WEATHER REPORTS BEING TESTED

Federal Aviation Agency flight inspection pilots, who regularly conduct inflight accuracy checks of ground navigation aids, are now radioing hourly weather reports to FAA flight service stations in a test program to determine whether such reports can improve weather briefing and forecasting services to general aviation pilots. The test program will end next month.

The FAA pilots report the presence of turbulence, thunderstorms, visibility under five miles, cloud ceilings under 5,000 feet and any unusual weather conditions which might affect flight safety.

Nearly 300 flight service stations, manned by FAA specialists, provide preflight and in-flight weather briefing services to pilots. These briefings, for the most part, are based upon regular surface weather observations made by both FAA and Weather Bureau observers and transmitted to all flight service stations via the Weather Bureau's teletype network. General aviation pilots rely almost entirely upon this information for planning and conducting their flights.

To supplement surface observations, pilots have for some time been encouraged to radio flight service stations with reports of adverse weather conditions. But these repotrs are received only sporadically. The FAA test will provide regular weather observations by pilots flying daily missions who often will be in in a better position to observe weather movement and changes.

The 90-day test, which began on Feb. 15, is being conducted in FAA's Eastern Region.

President Asks for Creation of Department of Transportation

President Johnson asked Congress last month to create a cabinet level Department of Transportation to bring together personnel and funds now devoted to transportation. The Department of Transportation would include as elements the Federal Aviation Agency, U.S. Coast Guard, Office of the Under Secretary of Commerce for Transportation, Bureau of Public Roads, Maritime Administration, St. Lawrence Seaway Corporation, Alaskan Railway, safety functions of the Civil Aeronautics Board and the Interstate Commerce Commission, and other related activities.

The establishment of the Department would have no immediate impact on the operation of the FAA.

Letters

FAA

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. No anonymous letters will be used, but names will be withheld on request.

• Wants Peek into Future

I'm engaged in research to determine the theoretically perfect runway for an international airport in the year 2000. I would be interested in any information or theories as to how you think this problem will be handled in the future.

East St. Louis, Ill.

It is not possible to give a direct, accurate answer to your question since aviation technology changes daily.

Current runway predictions are based on the introduction of the supersonic transport. It is not anticipated that the SST will impose any greater runway length or strength requirements than current subsonic aircraft. A primary runway length of about 10,500 feet plus standard corrections for altitude and gradient, and runway strength able to support an aircraft with a gross weight of 350,000 pounds and a dual tandem gear, are now anticipated to be adequate through 1975.

In addition to strength and length we have many standards which include maximum lateral and longitudinal grades, line-of-sight criteria, vertical curve separations, shoulder and other site preparation, approach protection criteria, jet blast protection, taxiway exit needs and other standards regarding navigational aids and lighting equipment.

By the year 2000, many of these standards may be altered.

Technical advances in design and operation of VSTOL, rocketcraft, etc., will be great by 2000. Many new aircraft designs and new methods of controlling air traffic will doubtless be developed by then.

• Report Cards on the Way Soon

I recently passed the Instrument written test with a grade of 74 per cent. This is very gratifying, but it also means that I got 26 per cent of the 80 questions wrong. What bothers me is that the 21 questions I missed might all be in the same area of knowledge.

If this was the case, then I could be very weak in some procedure and not have the facts that will enable me to improve the particular weak spot. It is my suggestion that FAA send *successful* applicants of written tests a breakdown suggesting further study of particular procedures. This would enable the conscientious student to correct any lack of knowledge and thereby contribute to aviation safety.

Colorado Springs, Colo.

The FAA has for many years provided the information you mention, whether the person passed or failed. However, due to limited resources and the large number of applicants examined (125,000 in 33 certification and rating areas in 1965), the FAA has had to limit this hand-tailored service only to those requesting it.

You will be pleased to know that plans are well under way to supply this advisory information promptly, by the use of automatic data processing equipment, to all *applicants who attain a grade of at least 50 per cent.*

An analysis of your performance has been sent to you, along with a set of four IFR Exam-O-Grams which we send to each applicant who fails the instrument pilot written examination. This safety training material will provide detailed information and guidance in appropriate areas of aeronautical knowledge.

• A Matter of Time

Why is a distinction made between solo and pilot-in-command time? I like to take my wife and son along when flying, which makes that time, I assume, pilot-in-command time. Now that I'm aiming at the 200-hour barrier I must go through my log and add up the hours when I was the only person in the plane, and then fly alone enough to meet the solo requirement. My log makes no provision for splitting the time. What is the rationale for this requirement?

R. E. Gardner
Seattle, Wash.

For pilots holding a private pilot certificate, the difference between "solo" and "pilot-in-command" time is largely academic. The logbook provision of FAR 61.39 (a)(2) lists "'pilot-in-command or solo" as one of the four types of pilot time which may be logged, because a student pilot is not authorized to log "pilot-in-command" time.

An applicant for a commerical pilot certificate with the 20 hours solo time required for a private certificate can meet the experience requirements of FAR 61.115 (for commercial certificate) without additional solo flight time.

After qualifying for a commercial pilot certificate, solo flight time is specified by the regulations only for the addition of certain aircraft ratings to existing pilot certificates. There is no reason for a private or commercial pilot to differentiate between his solo and other pilot-in-command time unless he is preparing to meet the requirement for an additional aircraft category or class rating.

• Pilots Want to be Safe

Congratulations on your mailing of the pamphlet *Wake Turbulence* which I just received. In the more than 20 years I have held an airman certificate, this is the first time I have received unsolicited air safety information in the mail from the Government. Most pilots want to be safe.

Robert L. Saloschin
Bethesda, Md.

Glad you liked the pamphlet. Single copies are available to pilots from the FAA, HQ-438, Washington, D. C. 20553. No charge. A 15-minute, color training film on wake turbulence will be available late this month from the FAA Film Library, FAA Aeronautical Center, P. O. Box 1082, Oklahoma City, Okla. 73101.

• Aircraft Markings

What is the significance of the designations NC, NX and NR on early U.S. aircraft? When and why was the NC designation changed to the current N? Could you print a tabulation of the identification letter codes for aircraft of other countries.

John Hubbard
Baltimore

The letter N, which identifies an aircraft registered in the U.S., was first assigned to the United States in 1919 by the Convention Relating to International Air Navigation (Annex A). However, the N was required only for flights outside the U.S. until Civil Air Regulation Part 02 became effective in 1937. Then the N was to be followed by C, R or X. The C indicated the aircraft fully complied with the minimum airworthiness requirements specified in the CARs. The R identified aircraft that had fully complied with the airworthiness requirements except for those which were not applicable to the special purpose for which the aircraft was to be used. The X indicated an experimental aircraft. An L was added as an airworthiness classification in 1946 (in an amendment to CAR 43) to indicate a military type aircraft which had complied with the requirements of CAR 9.

In May 1948, Amendment 43-3 to CAR 43 eliminated the use of C, R, X and L simply to save space because of the increasing number of aircraft being registered. Aircraft classified other than "standard," were required to have "restricted" or "limited" displayed in some conspicuous location on the aircraft in a manner prescribed by the Administrator. These are essentially the same requirements in effect today, although as of January 1966 markings were required to be at least 12 inches high to assist the Agency in carrying out its safety and enforcement responsibilities.

Here is a partial list of aircraft nationality marks registered with ICAO as of Jan. 15, 1965:

Argentina LV, LQ; Australia VH; Belgium OO; Bolivia CP; Brazil PP, PT; Canada CF; Chile CC; China (Taipeh Taiwan) B; Colombia HK; Cuba CU; Czechoslovakia OK; Denmark OY; Dominican Republic HI; Ecuador HC; Finland OH; France F; Germany (Federal Republic of) D; Ghana 9G; Haiti HH; Honduras HR; Hungary HA; India VT; Indonesia PK; Ireland EI, EJ; Israel 4X; Italy I; Japan JA; Korea (Republic of) HL; Malaysia 9M; Mexico XA, XB, XC; Netherlands PH; Norway LN; Panama HP; Peru OB; Philippines PI; Poland SP; Spain EC; Sweden SE; Switzerland HB (plus national emblem); Turkey TC; United Arab Republic SU; United Kingdom G; Venezuela YV; Viet-Nam XV; Yugoslavia YU.

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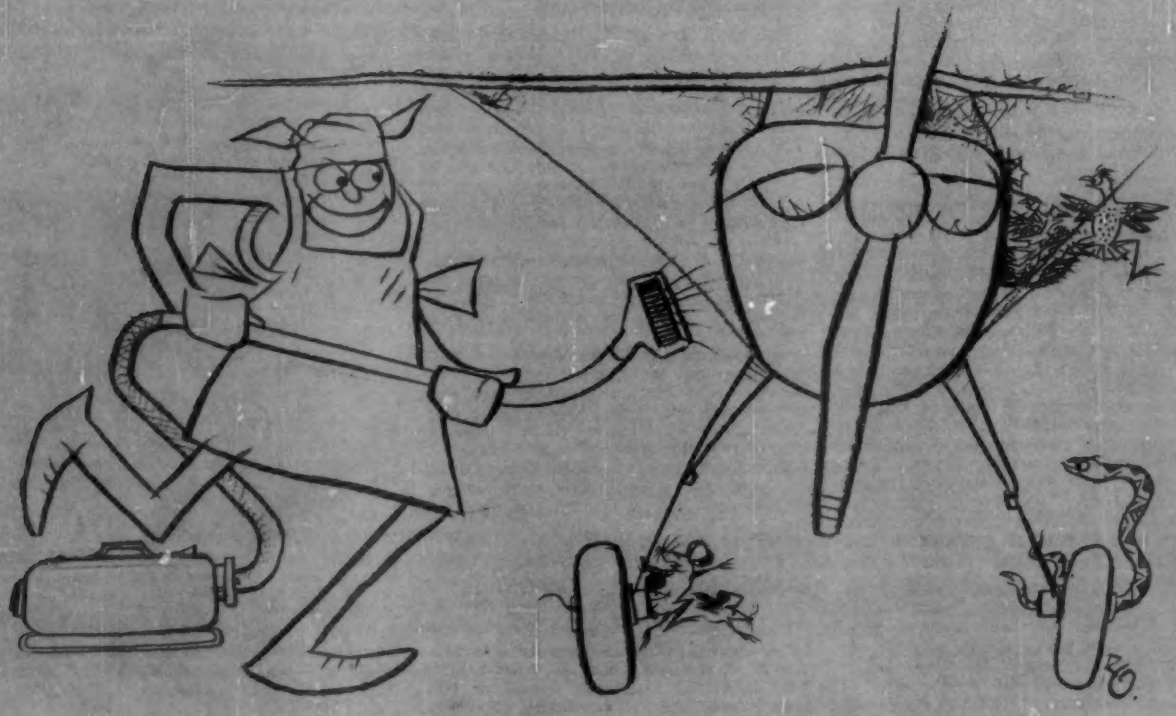

Clean plane means no accident.